WHAT IS CLAIMED IS:

1. A method for determining the thickness of a ferromagnetic material having known conductivity and permeability comprising the steps of:

(a) engaging a constant signal with the ferromagnetic material for inducing a changed signal,

(b) generating a stepped saturation signal over a range of currents for engagement with the ferromagnetic material,

(c) detecting the changed signal as the saturation signal is varied over the range of currents,

(d) determining the relationship between the changed signal and the stepped saturation signal, and

(e) evaluating the thickness of the material based upon the relationship between the changed signal and the stepped saturation signal.

2. The method defined in claim 1 for determining the thickness of a ferromagnetic material having known conductivity and permeability wherein the step of determining the relationship between the changed signal and the stepped saturation signal comprises the steps of:

(a) for a plurality of thicknesses, normalizing the changed signal,

(b) plotting the normalized changed signal versus the stepped saturation signal for generating a normalized curve for each thickness of material,

(c) determining the deviation of each normalized curve from a standard curve for each thickness of material, and

(d) determining a total deviation associated with each normalized curve for each thickness.

3. The method defined in claim 1 for determining the thickness of a ferromagnetic material having known conductivity and permeability wherein the step of evaluating the thickness of the material based upon the relationship between the changed signal and the stepped saturation signal comprises the steps of:

(a) deriving a function from the relationship of the deviation of each normalized curve for each thickness of material, and

(b) evaluating the thickness of the material based upon the function such that for any deviation a thickness can be determined.

4. A method for determining the thickness of a ferromagnetic material having known conductivity and permeability comprising the steps of:

(a) engaging a constant signal with the ferromagnetic material for inducing a changed signal,

(b) generating a saturation signal over a range of currents for engagement with the ferromagnetic material,

(c) detecting the changed signal as the saturation signal is varied over the range of currents,

(d) determining the relationship between the changed signal and the saturation signal, further comprising:

(1) for a plurality of thicknesses, normalizing the changed signal,

(2) plotting the normalized changed signal versus the stepped saturation signal for generating a normalized curve for each thickness of material,

(3) determining the deviation of each normalized curve from a standard curve for each thickness of material, and

(4) determining a deviation associated with each normalized curve for each thickness, and

(e) evaluating the thickness of the material based upon the relationship between the changed signal and the saturation signal, further comprising:

(1) deriving a function from the relationship of the deviation of each normalized curve for each thickness of material, and

(2) evaluating the thickness of the material based upon the function such that for any deviation a thickness is determined.

5. An apparatus for determining the thickness of a ferromagnetic material having known conductivity and permeability comprising:

(a) a transmitter for engaging a constant signal with the ferromagnetic material for creating a changed signal,

(b) a saturation device for generating a saturation signal over a range of currents for engagement with the ferromagnetic material,

(c) a receiver for detecting the changed signal as the saturation signal is varied over the range of currents, such that the relationship between the changed signal and the saturation signal is determined, and the thickness of the material based upon the relationship is determined.

6. A method for determining the thickness of a ferromagnetic material having known conductivity and permeability comprising the steps of:

(a) engaging a constant signal with the ferromagnetic material for inducing an changed signal,

(b) generating a swept saturation signal over a range of current for engagement with the ferromagnetic material,

(c) detecting the changed signal as the saturation signal is swept over the range of currents,

(d) determining the relationship between the changed signal and the swept saturation signal, and

(e) evaluating the thickness of the material based upon the relationship between the changed signal and the swept saturation signal.

7. The method defined in claim 6 for determining the thickness of a ferromagnetic material having known conductivity and permeability wherein the step of determining the relationship between the altered transmitter signal and the swept-frequency saturation signal comprises the steps of:

(a) for a plurality of thicknesses, normalizing the changed signal,

(b) plotting the normalized changed signal versus the swept saturation signal for generating a normalized curve for each thickness of material,

(c) determining the deviation of each normalized curve from a standard curve for each thickness of material, and

(d) determining a deviation associated with each normalized curve for each thickness.

8. The method defined in claim 6 for determining the thickness of a ferromagnetic material having known conductivity and permeability wherein the step of evaluating the thickness of the material based upon the relationship between the changed signal and the swept saturation signal comprises the steps of:

(a) deriving a function from the relationship of the deviation of each normalized curve for each thickness of material, and

(b) evaluating the thickness of the material based upon the function such that for any deviation a thickness can be determined.

9. A method for determining the thickness of a ferromagnetic material having known conductivity and permeability comprising the steps of:

(a) engaging a constant signal with the ferromagnetic material for creating an changed signal,

(b) generating a saturation signal over a range of currents for engagement with the ferromagnetic material,

(c) detecting the changed signal as the saturation signal is varied over the range of currents,

(d) determining the relationship between the changed signal and the saturation signal, further comprising:

(1) for a plurality of thicknesses, normalizing the changed signal,

(2) plotting the normalized changed signal versus the saturation signal for generating a normalized curve for each thickness of material,

(3) determining the deviation of each normalized curve from a standard curve for each thickness of material, and

(4) determining a deviation associated with each normalized curve for each thickness, and

(e) evaluating the thickness of the material based upon the relationship between the changed signal and the saturation signal, further comprising:

(1) deriving a function from the relationship of the deviation of each normalized curve for each thickness of material, and

(2) evaluating the thickness of the material based upon the function such that for any deviation a thickness is determined.